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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/826,182	04/04/2001	Charles Persico	990515	2852

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QUALCOMM Incorporated
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EXAMINER
VUONG, QUOCHIEN B

ART UNIT	PAPER NUMBER
2681	

DATE MAILED: 02/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/826,182	PERSICO ET AL.	
	Examiner	Art Unit	
	Quochien B Vuong	2681	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 10/28/02 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3-5, 8-14, 17, 20, and 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Boyd (U.S. Patent Number 4,317,083).

Regarding claim 1, Boyd (figure 5) discloses a bias controlled amplifier comprising: one or more amplifier stages (item 10) coupled together and configured to receive and amplify an input signal to provide an output signal; and a control unit (the combination of items 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, and 36) operatively coupled to the one or more amplifier stages and configured to detect a level of the output signal and, based on the detected output signal level, provide at least one bias control signal for adjusting a bias of at least one amplifier stage (column 4, lines 4-62).

Regarding claim 3, Boyd discloses the control unit includes a power detector (item 14) configured to detect the output signal level and provide a detected signal indicative of the detected output signal level, a conditioning unit (the combination of items 16, 18, 20, 22, 24, 26, 28, 30, and 32) coupled to the power detector and configured to receive and condition the detected signal to provide at least one conditioned signal, and a bias control generator (item 36) coupled to the conditioning unit and configured to receive the at least one conditioned signal and provide the at least one bias control signal (column 4, lines 20-62).

Regarding claim 4, Boyd discloses the conditioning unit is configured to provide a first transfer characteristic selected to provide a desired overall transfer characteristic for bias adjustment of the at least one amplifier stage (column 4, lines 20-28).

Regarding claim 5, Boyd discloses the first transfer characteristic approximates a logarithmic function (column 4, lines 20-28).

Regarding claims 8 and 9, Boyd discloses the control unit further includes: a lowpass filter (within item 14) configured to receive and filter the detected signal to provide a filtered signal, wherein the conditioning unit is configured to receive and condition the filtered signal, and wherein the lowpass filter is configured to filter an envelop in the detected signal (column 4, lines 6-23).

Regarding claim 10, Boyd discloses the power detector is configured to detect a power level of the output signal (column 4, lines 6-12).

Regarding claim 11, Boyd discloses the bias controlled amplifier further comprising: a coupler (item 16) operatively coupled to an output stage of the one or

more amplifier stages and configured to couple a portion of the output signal to the control unit (column 4, lines 6-9).

Regarding claim 12, Boyd discloses the control unit is configured to provide analog-like adjustment of the at least one bias control signal (column 4, lines 20-28; and column 6, line 63).

Regarding claim 13, Boyd discloses the control unit is configured to continually detect the output signal level and update the at least one bias control signal (column 4, lines 56-62).

Regarding claim 14, Boyd discloses the bias control signal adjusts the bias of an associated amplifier stage to achieve a particular level of linearity (column 3, lines 51-53).

Regarding claim 17, Boyd discloses each of the at least one amplifier stage is adjusted based on a respective transfer function of bias versus detected output signal level (column 4, lines 9-28).

Regarding claim 20, Boyd discloses the one or more amplifier stages are coupled in series (see figure 5).

Regarding claim 22, Boyd (figure 5) discloses a bias controlled power amplifier comprising: one or more amplifier stages (item 10) coupled in series and configured to receive and amplify an input signal to provide an output signal; a coupler (item 16) operatively coupled to an output stage of the one or more amplifier stages and configured to couple a portion of the output signal; a power detector (item 14) coupled to the coupler and configured to detect a level of the output signal based on the coupled

portion and provide a detected signal indicative of the detected output signal level; a conditioning unit (the combination of items 16, 18, 20, 22, 24, 26, 28, 30, and 32) coupled to the power detector and configured to receive and condition the detected signal to provide at least one conditioned signal; and a bias control generator (item 36) coupled to the conditioning unit and configured to receive the at least one conditioned signal and provide at least one bias control signal for adjusting a bias of at least one amplifier stage (column 4, lines 4-62).

Regarding claim 23, Boyd (figure 5) discloses a method for adjusting a bias of a multi-stage amplifier, comprising: receiving and amplifying an input signal with one or more amplifier stages to provide an output signal (column 4, lines 4-6); detecting a level of the output signal (column 4, lines 6-12); conditioning a detected signal indicative of the detected output signal level to provide at least one conditioned signal (column 4, lines 12-60); forming at least one bias control signal based on the at least one conditioned signal; and adjusting the bias of at least one amplifier stage with the at least one bias control signal (column 4, lines 60-62).

Regarding claim 24, Boyd discloses the conditioning is performed with analog circuitry (column 4, lines 20-28; and column 6, line 63) having a first transfer characteristic selected to provide a desired overall transfer characteristic for bias adjustment of the at least one amplifier stage.

4. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al. (EP 0803973A1).

Regarding claim 1, Chen et al. (figure 2) disclose a bias controlled amplifier comprising: one or more amplifier stages (item 38) coupled together and configured to receive and amplify an input signal to provide an output signal; and a control unit (item 46) operatively coupled to the one or more amplifier stages and configured to detect a level of the output signal and, based on the detected output signal level, provide at least one bias control signal for adjusting a bias of at least one amplifier stage (column 4, lines 7-56).

Regarding claim 2, Chen et al. disclose the bias control signal adjusts a bias current of an associated amplifier stage (column 4, lines 47-56).

5. Claims 1 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Mitzlaff (U.S. Patent Number 5,307,512).

Regarding claim 1, Mitzlaff (figure 2) discloses a bias controlled amplifier comprising: one or more amplifier stages (item 227) coupled together and configured to receive and amplify an input signal to provide an output signal; and a control unit (item 236) operatively coupled to the one or more amplifier stages and configured to detect a level of the output signal and, based on the detected output signal level, provide at least one bias control signal (signal 225) for adjusting a bias of at least one amplifier stage (column 2, line 23 – column 4, line 18).

Regarding claim 21, Mitzlaff discloses the input signal (figure 2, signal 101) is a CDMA modulated signal since it is use in CDMA cellular system (column 1, lines 22-25).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 6, 7, 18, 19, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyd in view of Mitzlaff.

Regarding claim 6, Boyd disclose the bias controlled amplifier of claim 4. Boyd does not disclose at least a portion of the conditioning unit is implemented with digital circuitry. However, Mitzlaff discloses at least a portion of the control unit is implemented with digital circuitry (column2, lines 9-15; and column 3, lines 9-23). Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to adapt the digital circuitry of Mitzlaff to the bias controller amplifier of Boyd for more precisely generating the bias signal to control the amplifier in order to get a desired output signal.

Regarding claim 7, Boyd and Mitzlaff disclose the bias controlled amplifier of claim 6. In addition, Boyd discloses the first transfer characteristic is a logarithmic function (column 4, lines 20-28) and it would be obviously implemented with a look-up table.

Regarding claims 18 and 19, Boyd discloses the bias controlled amplifier of claim 1. Boyd does not specifically disclose the bias control signal is limited to within a range of values, and the bias control signal has a minimum value. However, Mitzlaff discloses

a bias control signal is limited to within a range of values, and the bias control signal has a minimum value (column 3, line 64 – column 4, line 18). Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to adapt the teaching of Mitzlaff to the bias controlled amplifier of Boyd for controlling the amplification to produce the output signal at a certain range for use in a desired application.

Regarding claim 25, Boyd discloses the method of claim 23. In addition, Boyd discloses a first transfer characteristic selected to provide a desired overall transfer characteristic for bias adjustment of the at least one amplifier stage (column 4, lines 20-28). Boyd does not disclose the conditioning is performed with digital circuitry. However, Mitzlaff discloses at least a portion of the control unit is implemented with digital circuitry (column2, lines 9-15; and column 3, lines 9-23). Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to adapt the digital circuitry of Mitzlaff to the method of Boyd for more precisely generating the bias signal to control the amplifier in order to get a desired output signal.

8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boyd in view of Nummila (U.S. Patent Number 5,912,588).

Regarding claim 15, Boyd disclose the bias controlled amplifier of claim 14. Boyd does not specifically disclose each bias control signal further adjusts the bias of the associated amplifier stage to reduce power consumption. However, it is well known in the art to use a bias control signal for adjusting the bias of the associated amplifier

stage to reduce power consumption as taught by Nummila (column 1, lines 5-20; and figure 9). Therefore, it would have been obvious for one having ordinary skill in the art to adapt the teaching of Nummila to the bias controlled amplifier of Boyd to reduce the power consumption for lengthening the time a communication unit can be used without recharging its baterry.

9. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boyd in view of Ekman et al. (U.S. Patent Number 6,288,606).

Regarding claim 16, Boyd discloses the bias controlled amplifier of claim 1. Boyd does not specifically disclose each bias control signal adjusts the bias of an associated amplifier stage in a manner to reduce phase discontinuity in the output signal. However, Ekman et al. disclose using a bias control signal adjusts the bias of an associated amplifier stage in a manner to reduce phase discontinuity in the output signal (column 6, lines 38-44, and figures 3-4). Therefore, it would have been obvious for one having ordinary skill in the art to adapt the teaching of Ekman et al. to the bias controlled amplifier of Boyd to reduce the phase distortion in the power amplifier for linearity amplification throughout a large dynamic range.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Opas (U.S. Patent Number 5,023,937) discloses a transmitter with improved amplifier control.

Davis et al. (U.S. Patent Number 5,640,691) disclose a power controller for RF transmitter.

11. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 308-6306 or (703) 308-6296.

Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington, VA 22202. Sixth Floor (Receptionist).

Any inquiry concerning this communication from the examiner should be directed to Quochien B. Vuong whose telephone number is (703) 306-4530. The examiner can normally be reached on Monday through Friday from 9:30 a.m. to 6:00 p.m. EST.

If attemps to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne Bost, can be reached on (703) 305-4778.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Customer Service Representative whose telephone number is (703) 306-0377.

QUOCHIEN VUONG
PATENT EXAMINER

Quochien B. Vuong
Feb. 20, 2003.